

CLAIMS

1/ A method of alternating the stacking direction (3) of flat and flexible objects which are received as they are produced by a device (1) which places them side by side substantially parallel to one another, so as to enable them to constitute batches (2), said device (1) comprising a plurality of compartments (1A) supported by an element (1B) for moving the compartments between at least two stations (1C, 1D), comprising firstly a station (1C) for loading said compartments (1A) with items (3) delivered in succession in a determined insertion direction (S1), and secondly a station (1D) for unloading at least one set (E) of items ready to constitute a batch (2),

the method being characterized in that in order to make up sets (E) of items suitable for constituting batches (2) of items (3) in which at least two items (3) are placed head-to-tail, the following operations are performed during travel of the compartments (1A) past the loading station (1C), downstream from said station (1C):

- at a determined "extraction" site (A), at least one item (3) is extracted from a compartment (1A) in which it has been placed; and

- the orientation of each extracted item (3) is changed so that it can be placed in a determined empty compartment (1A) head-to-tail relative to its initial insertion direction (S1) in the loading station (1C); and

- at a determined "reinsertion" station (B) said reoriented item (3) is inserted into an empty compartment (1A).

2/ A method according to claim 1, characterized in that the items (3) are extracted and then reinserted in succession, i.e. they are acted on one by one.

3/ A method according to claim 1 or 2, characterized in that each item (3) is reinserted into a compartment (1A)

which, relative to the travel direction, is situated downstream from the compartment (1A) from which the extraction has been performed.

5 4/ A method according to any one of claims 1 to 3, characterized in that in order to turn each item (3) extracted from a compartment (1A) end-for-end, it is caused to follow a curved path (T1) situated in a plane (P1) approximately parallel to a plane (P2) containing
10 the travel path (T2) of the compartments (1A) between the extraction site (A) and the site (B) for reinsertion into a compartment (1A).

15 5/ A method according to any one of claims 1 to 4, characterized in that the means comprise:
· extraction means (M1) for extracting at least one item (3) from the compartments (1A) at a determined "extraction" site (A); and
· orientation-changing means (M2) for changing the
20 orientation of each extracted item (3) so that it can be placed in a determined compartment (1A) head-to-tail relative to its initial insertion direction; and
· insertion means (M3) for inserting said reoriented item (3) in an empty compartment (1A) at a likewise
25 determined "reinsertion" site (B); together with
· control means (M4) for controlling the operation of the above-specified means (M1, M2, M3) synchronously with the device (1) for making up batches (2).

30 6/ Means for implementing the method according to any one of claims 1 to 5, characterized in that the extraction means (M1) comprises a drive-and-guide element (11) for driving and guiding at least one extractor stop (12) over an "accompanying" path, i.e. a path (T3) which intersects
35 the path (T2) of the compartments (1A) in a plane onto which the paths are projected, said accompanying path being oriented in such a manner that each extractor stop

(12) that comes into contact with an item (3) pushes it out from its compartment (1A) at the extraction site (A), and continues to do so at least until said item (3) has been engaged in the orientation-changing means (M2).

5

7/ Means according to claim 6, characterized in that the orientation-changing means (M2) for changing the orientation of each extracted item (3), i.e. the means (M2) for turning end-for-end each item (3) extracted from a compartment (1A), consists in means (M2) for guiding the item (3) over a curved path (T1) situated in a plane that is approximately parallel to a plane containing the travel path (T2), of the compartments (1A) between the extraction site (A) and the site (B) for reinsertion into a compartment (1A).

10
15

8/ Means according to claim 6, characterized in that the insertion means (M3) for inserting each item (3) one by one into an empty compartment (1A) is constituted by means (M3) for displacing each item (3) along a path (T4) which intersects the path of the compartments (1A) in a plane onto which the paths are projected, and which is oriented in such a manner that each item (3) is pushed into a compartment (1A), and is pushed at least until said item (3) has been fully engaged in said compartment (1A).

20
25

9/ Means according to claim 6, characterized in that the orientation-changing means (M2) for changing the orientation of each item (3) extracted from a compartment (1A) essentially comprises a set of two belts (C1, C2) which, driven by motor means (R1) travel over deflector members (R1 to R9) and present two adjacent strands (B1, B2), which strands (B1, B2) define means both for gripping an item (3) across its thickness and for moving said item (3) over a path (T1) that is substantially curved, said adjacent strands (B1, B2) for this purpose:

30
35

- firstly each extending between the site (A) for extracting an item (3) from a compartment (1A) and the site (B) for reinserting said item (3) in a compartment (1A); and
 - 5 · secondly being situated in a plane that is approximately parallel to a plane containing the travel path (T2) of the compartments (1A) between said extraction and reinsertion sites (A, B).
- 10 10/ Means according to claim 9, characterized in that the orientation-changing means (M2) comprises:
- firstly a deflector member (R1) of diameter (D) such that over a substantial fraction of its circumference it defines a curved path (T1) that is
 - 15 tangentially connected to the extraction and insertion paths (T3, T4) for the items (3); and
 - secondly deflector members (R2, R3) which are disposed in such a manner as to deflect and space apart the belts (C1, C2) approximately into a plane that is
 - 20 substantially tangential to the compartments, thereby constituting at least in part the insertion means (M3) for inserting each item (3) one by one into an empty compartment (1A).
- 25 11/ An installation for making up batches of objects, the installation being characterized in that it comprises means according to any one of claims 6 to 10.